

WHAT IS CLAIMED IS:

1. A semiconductor chip comprising:
a plurality of first elements each of which diagnoses itself; and
a second element which inputs diagnosis results from said first elements and
determines whether or not there is a faulty first element in said first elements.

2. The semiconductor chip as claimed in claim 1, wherein said second element
determines whether or not there is a faulty first element in said first elements based on
said diagnosis results by using majority logic.

3. The semiconductor chip as claimed in claim 1, wherein said second element
includes:

third elements which correspond to pins of said first element, each of which
inputs said diagnosis results from same pins of said first elements, respectively, and
each of which determine a minority one of said first elements based on said diagnosis
results; and

fourth elements which correspond to said first elements and which determine
whether or not the corresponding first element fails based on outputs from said third
elements.

4. The semiconductor chip as claimed in claim 3, wherein said second element
further includes a fifth element which outputs information about a faulty first element to
said first elements.

1 5. The semiconductor chip as claimed in claim 1, further comprising a memory
2 element which stores a program for diagnosing said first elements.

1 6. The semiconductor chip as claimed in claim 1, further comprising a sixth
2 element which cannot diagnose itself.

1 7. The semiconductor chip as claimed in claim 6, wherein said sixth element is
2 selected from a group consisting of a main memory, a main memory controller, and a
3 processor which controls input and output process.

1 8. The semiconductor chip as claimed in claim 1, further comprising an external
2 input which input a diagnosis program; and
3 a seventh element which selects to load a diagnosis program from said
4 memory element or said external input.

1 9. The semiconductor chip as claimed in claim 8, further comprising a register
2 which stores information indicating which of a diagnosis program from said memory
3 element or said external input said seventh element selects.

1 10. The semiconductor chip as claimed in claim 1, further comprising an eighth
2 element which selects, as a trigger, a first signal set by a user or a second signal from
3 a semiconductor chip which controls start up.

1 11. The semiconductor chip as claimed in claim 10, further comprising a register
2 which stores information indicating which of said first or second signal said eighth
3 element selects.

Sub 12
1 12. A method which is performed in a semiconductor chip including a plurality of first
2 elements, comprising:
3 diagnosing said first elements each by itself; and
4 determining whether or not there is a faulty first element in said first elements
5 based on diagnosis results from said first elements.

1 13. The method as claimed in claim 12, wherein said faulty first element in said first
2 elements is determined based on said diagnosis results by using majority logic during
3 said determining step.

1 14. The method as claimed in claim 12, further comprising:
2 discriminating a minority one of said first elements based on diagnosis results
3 input from same pins of said first elements; and
4 determining whether or not said first element fails based on the determined
5 result determined during said discriminating step.

Sub 15
1 15. The method as claimed in claim 14, further comprising:
2 outputting information about a faulty first element to said first elements.

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1 16. The method as claimed in claim 12, further comprising:
2 diagnosing a sixth element which cannot diagnose itself.

1 17. The method as claimed in claim 12, wherein said semiconductor chip includes a
2 memory element which stores a diagnosis program and an external input;
3 further comprising:
4 selecting to load a diagnosis program from said memory element or said external input.

1 18. The method as claimed in claim 12, further comprising:
2 selecting, as a trigger, a first signal set by a user or a second signal from a
3 semiconductor chip which controls start up.